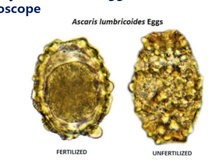
Helmints

Nematodes (roundworms)

Ingested

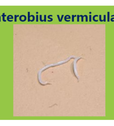
Ascaris lumbricoides (giant roundworm)

- **Disease:** May cause obstruction at ileocecal valve, biliary obstruction, intestinal perforation, migrates from nose/mouth. Migration of larvae to alveoli-Löeffler syndrome (pulmonary eosinophilia).
- **Diagnosis:** knobby-coated, oval eggs seen in feces under microscope



- **Treatment:** Bendazoles

Enterobius vermicularis



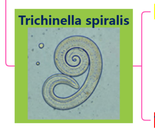
- **Disease:** Causes anal pruritus, worse at night.
- **Diagnosis:** Eggs visualized via tape test

- **Treatment:** Bendazoles, pyrantel pamoate

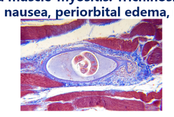
Toxocara canis

- **Disease:** Visceral larva migrans—migration into blood-inflammation of liver, eyes (visual impairment), CNS (seizures, coma), heart (myocarditis). Patients often asymptomatic
- **Treatment:** Bendazoles

Trichinella spiralis



- **Disease:** Acquired from pork and bear meat consumption. Larvae enter bloodstream, encyst in striated muscle-myositis. Trichinosis—fever, vomiting, nausea, periorbital edema, myalgia



- **Treatment:** Bendazoles

Larvae penetrate skin

Strongyloides stercoralis

- **Disease:** GI (eg, duodenitis), pulmonary (eg, dry cough, hemoptysis), and cutaneous (eg, pruritus) symptoms. Hyperinfection syndrome can be caused by accelerated autoinfection in the immunocompromised.
- **Treatment:** Ivermectin or bendazoles

Hookworms

- Necator americanus, Ancylostoma duodenale
  - **Disease:** Cause microcytic anemia by sucking blood from intestinal wall. Cutaneous larva migrans—pruritic, serpiginous rash

  - **Treatment:** Bendazoles, pyrantel pamoate

Acquired via bites

Black fly

- Onchorerca volvulus
  - **Disease:** Black skin nodules, river blindness ("black sight")

  - **Treatment:** Ivermectin

Female mosquito

- Wuchereria bancrofti, Brugia malayi
  - **Disease:** Lymphatic filariasis (elephantiasis)— worms invade lymph nodes. inflammation-lymphedema ; symptom onset after 9 mo–1 yr.

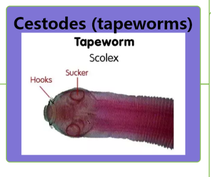
  - **Treatment:** Dietylcarbamazine

Deer, horse, or mango fly

- Loa loa
  - **Disease:** Swelling in skin, worm in conjunctiva

  - **Treatment:** Dietylcarbamazine

Cestodes (tapeworms)

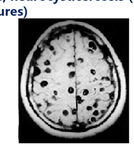


Diphyllobothrium latum

- **Disease:** Vitamin B12 deficiency (tapeworm competes for B12 in intestine)-megaloblastic anemia
- **Transmission:** Ingestion of larvae in raw freshwater fish
- **Treatment:** Praziquantel, niclosamide

Taenia

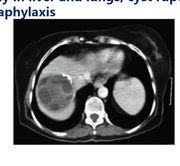
- Taenia solium
  - **Disease:** Intestinal tapeworm
  - **Transmission:** Ingestion of larvae encysted in undercooked pork
  - **Treatment:** Praziquantel
- Taenia sagginatum
  - **Disease:** Cysticercosis, neurocysticercosis (cystic CNS lesions, seizures)



  - **Transmission:** Ingestion of eggs in food contaminated with human feces
  - **Treatment:** Praziquantel; albendazole for neurocysticercosis

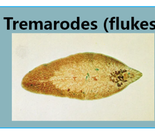
Echinococcus granulosus

- **Disease:** Hydatid cysts ("eggshell calcification") most commonly in liver and lungs; cyst rupture can cause anaphylaxis



- **Transmission:** Ingestion of eggs in food contaminated with dog feces Sheep are an intermediate host
- **Treatment:** Albendazole; surgery for complicated cysts

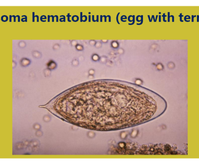
Tremarodes (flukes)



Schistosoma

- **Disease:**
  - Schistosoma mansoni, Schistosoma japanicum (egg with lateral spine)

    - Can cause hepatosplenomegaly, liver damage, and GI symptoms
  - Schistosoma hematobium (egg with terminal spine)



    - Causes hematuria and squamous cell carcinoma of the bladder
- **Transmission:** Snails are intermediate host; cercariae penetrate skin of humans in contact with contaminated fresh water (eg, swimming or bathing)
- **Treatment:** Praziquantel

Clonorchis sinesis

- **Disease:** Biliary tract inflammation-pigmented gallstones Associated with cholangiocarcinoma
- **Transmission:** Undercooked fish
- **Treatment:** Praziquantel

Paragonimus westermani

- **Disease:** Travels from the GI tract to the lungs, where it causes hemoptysis
- **Transmission:** Undercooked crab meat
- **Treatment:** Praziquantel

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